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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/624,533	07/23/2003	Jon H. Krueger	P16541	6656

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EXAMINER	
HOMAYOUNMEHR, FARID	

ART UNIT	PAPER NUMBER
2132	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/624,533	KRUEGER ET AL.	
	Examiner	Art Unit	
	Farid Homayounmehr	2132	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 April 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This action is responsive to communications: application, filed 7/23/2003; amendment filed 4/9/2007.

2. Claims 1-40 are pending in the case.

Response to Arguments

3. Applicant's arguments have been fully considered.

4. Rejection under section 112, second paragraph:

Rejection of claims 1 and 14 under section 112 is withdrawn due to amendments by the applicant.

5. Rejection under section 103:

With regards to claims 1-24, applicant argues: "Thus, while Douceur does appear to disclose the concepts of index values and signature values, it appears that Douceur uses these concepts in the context of a linked list. In contrast, the invention of independent claims 1 and 14 each disclose apparatus that, by virtue of the first memory array the comparator and the second

memory array, provide for a hash-based lookup system that avoids the problems of serial reads throughout linked list data structures." However, the claimed invention includes: "the comparator is further configured to compare the signature value with the plurality of signature values of said data unit, and if a match is found, said comparator is further configured to generate said address of said index value and the position corresponding to the matching signature values". Therefore, The claimed invention also performs a comparison of a data value (signature) with the values stored in several fields (plurality of signature values of said data unit). Therefore, the problem of serial reads throughout a list of data structures is not avoided.

Applicant further argues: "Moreover, by examining the generated signature's position within a data unit in a first memory array, the payload data' s position in the second memory array may be determined and thus, permits the claimed apparatus to avoid traipsing across multiple entries as in the linked system." However, as indicated in the Final Office Action, the combination of Douceur and Green teaches using the position of the matching data field in the first array as an index to the address of the payload data in the second memory array (see rejection of claim 1). Therefore, the combination of references also teaches avoiding traipsing across multiple entries. The indexing performed by Douceur's system reduces the number of comparisons required to locate the payload.

Applicant further argues that Douceur does not disclose or suggest the combination of features provided by claims 1 and 14. However, the details of how the combination of

references teach all the elements of claims 1 and 14 were discussed in the previous Office Actions, and reflected in the following sections.

Applicant further states that Douceur teaches away from the invention of claims 1 and 14, since Douceur describes data retrieval in a linked list. However, applicant states no reason, and it is not clear why description of the invention in the context of a linked list teaches away from invention of claims 1 and 14.

Applicant further disagree with Examiner's characterization of Green, and argue: "However, as set forth above, the specific features of the first memory array, the comparator, and the second memory array are simply not discloses or suggested in Greene. Moreover, this specific combination of features now required by the invention of independent claims 1 and 14, as amended, are nowhere disclosed or suggested in any combination of Greene and Douceur." However, as stated previously, the details of how the combination of Douceur and Green teaches requirements of claims 1 and 14 were discussed in the previous Office Actions. The details of the combination teaching requirements of the amended claims are included in the following sections.

Applicant further argues that the combination of references is inappropriate because Douceur appears to teach away from the claimed invention. However, as mentioned above, no reason is stated to establish that Douceur teaches away from the claimed invention.

Based on the discussion above, applicant's arguments regarding allowability of claims 1 and 14 is non persuasive.

Applicant's argument relative to allowability of other claims is based on the allowability of claims 1 and 14. The following section describes detailed rejection of claims 1-40:

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 25-40 are rejected under 35 U.S.C. 102(b) as being anticipated by Douceur (U.S. Patent No. 6,067,547, dated May 23, 2000).

7.1. As per claim 25, Douceur is directed to a data retrieval method (column 9 lines 55-60), comprising: responsive to input data, generating an index value and a signature value through a hash function, retrieving a first data unit using the index value from a first memory array, comparing signature values in the first data unit to the generated signature value (column 3 line 50 to column 4 line 45 describes how a hash of input data is generated from input data, and how the hash is used locate a pointer to where

the data record corresponding to the input signal is identified by searching for a match with a key. Column 4 lines 21 to 28 discloses splitting the hash into an index and a signature), if a match occurs, retrieving a second data unit using the index value and a position of the signature value from a second memory array (column 1 line 35 to column 2 line 37. Note that the pointers are in the first memory array, and the second data unit (the data record) is in the second memory array. As an example, see Fig. 2 and associated text, indicating two memory arrays).

7.2. As per claim 26, Douceur is directed to the data retrieval method of claim 25, further comprising comparing the input data to a portion of data in the second data unit and, if they match, outputting a second portion of the data unit (column 1 line 60 to column 2 line 39. The second portion of the data unit is the other data fields in the record corresponding to the key).

7.3. As per claim 27 Douceur is directed to the data retrieval method of claim 26, further comprising, if the input data and the data portion do not match, outputting an indication that the input data misses the memory (column 2 line 25-39).

7.4. As per claim 28, Douceur is directed to the data retrieval method of claim 25, further comprising, if the generated signature does not match any signature in the first data unit, allocating a new entry to the input data and storing the generated signature in an unoccupied position of the first data unit (claim limitation describes the process of

insertion in a database equipped with hash table search mechanism as described in column 3 line 30 to 57).

7.5. As per claim 29, Douceur is directed to the data retrieval method of claim 25, wherein the index value and generated signature value each are selected from non-overlapping portions of a common hash value (column 4 line 25-27).

7.6. As per claims 30 to 32, Douceur is directed to the data retrieval method of claim 25, wherein the input data is IP source and destination addresses and TCP source and destination port designators and the IP address is either 32 or 128 bit long (Douceur method has no limitation on type and length of data that is input to the system).

7.7. Claims 33 to 40 are substantially the same as claims 25-32 above, with the added requirement of generating multiple index values in claim 33, as opposed to one index value in claim 25. Douceur column 18, lines 10-35 and Fig. 13 are directed to generation of multiple index values and then performing the search the same way as it is outlined in claims 25-32.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Douceur (U.S. Patent No. 6,067,547, dated May 23, 2000) as applied to claims 25-40 above, and further in view of Greene (U.S. patent No. 6'631'419, filed 9/22/1999).

8.1. As per claim 1, Douceur and Greene are directed to an apparatus for use in data retrieval, comprising: a hash value generator configured to generate an index value and a signature value, based on input data, (Douceur column 3 line 50 to column 4 line 45 describes how a hash of input data is generated from input data, and how the hash is used to locate a pointer to where the data record corresponding to the input signal is identified by searching for a match with a key. Column 4 lines 21 to 28 discloses splitting the hash into an index and a signature) a first memory array configured to receive the index value as an address, said first memory array is further configured to output, in response to said index value, a data unit comprising a plurality of signature values arranged in respective positions in said data unit, a comparator configured to receive the signature value and said data unit from the first memory array, the comparator is further configured to compare the signature value with the plurality of signature values of said data unit, and if a match is found, said comparator is further configured to generate said address of said index value and the position corresponding to the matching signature value (any of the hash tables indicated in Figures 1-13 and their associated text anticipates a first memory array, a comparator and the

connections. As an specific example, see Fig. 1, where the memory (hash table) is searched based on an index value (address generated) as shown in col. 3 lines 25-57, and a match is found by comparing the key with the values in the linked list (which is a data unit containing a plurality of signature values), as shown in col. 3 lines 57 to 65),

Douceur teaches data retrieval by searching for a signature match, and retrieving the data in the record where the matched signature was found. Douceur also teaches reporting the position of the matched information in column 15 line 20 to column 16 line 10, as it shows how the pointers to location of the matched data in the linked list must be adjusted when there is a split. Therefore Douceur determines the location of the matched data (output the location of matched data) in order to adjust the pointers to the new location of data, and teaches the comparator having an output for a position of a matching signature value. However, Douceur does not specifically teach finding a second index based on the information found at the location where the match was found, combining the second index with the original index to find the address where the data to be retrieved is stored.

Greene teaches generating an address based on part of the input data, finding the information stored at the generated address, and using the information stored at the generated address as a secondary index to be combined with the generated address to determine another address where the data is located (see for example Fig 1 or 23 and associated text). Therefore Greene teaches the limitation of a second memory

array configured to receive said address of said index value and the position corresponding to the matching signature value and, in response thereto, output payload data.

Greene and Douceur are analogous art as they are both directed to methods for fast data retrieval. At the time of invention, it would have been obvious to a person skilled in art to combine the additional indexing technique taught by Greene to Douceur's method of fast data retrieval using hash tables. The combination would find a matched signature in Douceur's hash table and report the position of where the match was found, and combine that data with the first index to determine the address of the location where the data to be retrieved is located.

The motivation to combine is improving the speed of data retrieval and expansion of memory addressable space as outlined in Greene column 1 line 24 to 3 line 15.

8.2. Limitations of claims 2-24 are substantially the same as limitations of claim 1 and claims 25-40 above. Note also that using the TCP/IP data as data to be retrieved, which is required by claims 8-10 and 19-21 is clearly taught by Greene.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Farid Homayounmehr whose telephone number is 571 272 3739. The examiner can normally be reached on 9 hrs Mon-Fri, off Monday biweekly.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gilberto Barron can be reached on (571) 272-3799. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Farid Homayounmehr

Examiner

Art Unit: 2132

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